

L13052-63
AT/IJP(C)

EWT(1)/EWG(k)/BDS/EEC(b)-2 AFFTC/ASD/ESD-3 Pz-4

ACCESSION NR: AT3002999

S/2927/62/000/000/0152/0176

AUTHOR: Kapitonov, A. I.; Tuchkevich, V. M.; Chelnokov, V. Ye.67
65

TITLE: Investigation of the current-voltage characteristics of diffusion electron-hole junctions in silicon [Report the All-Union Conference on Semiconductor Devices, held in Tashkent from 2 to 7 October 1961.]

SOURCE: Elektronno-dy*rochny*ye of perekhody* v poluprovodnikakh. Tashkent, Izd-vo AN UzSSR, 1962, 152-176

TOPIC TAGS: semiconductor, silicon p-n junction, diffusion silicon p-n junction

ABSTRACT: An extensive experimental investigation and comparisons of its results with existing theories are reported in the article. Current-voltage characteristics of silicon "sun batteries" studied by the authors in 1957 did not agree with the Shockley's "classical theory" (Bell Syst. Techn. J., 28, July, 1949); nor did it agree with the improved theory by C. T. Sah, R. Noyce, and W. Shockley (Proc. IRE, 45, 1957). A new method for manufacturing power silicon rectifiers by diffusing B into n-type Si was developed. The diffusion was conducted in air at high temperature. Resulting diodes with a 3.14-sq-cm p-n junction area passed about 1,000 amp of average rectified current (water cooling) and had a breakdown voltage

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ACCESSION NR: AT3002999

of 2,000 v. In 1962, power h-v diffusion Si rectifiers for 200 amp (air-cooled) and 350 amp (water-cooled), at 700 v were set in lot production. The following experiments are described in the article. Effects of applied reverse voltage on the capacitance and the width of space-charge region were determined. The reverse branch of the current-voltage characteristic was studied and interpreted in terms of space-charge-generated and recombination currents; also effects of junction environment (coating, etching, dry air, aging, kerosine, oil) on the current-voltage characteristic were investigated. The forward branch of the current-voltage characteristic was studied in detail: at low and medium voltages and at high injection levels; also effects of temperature were invested. As the current-voltage relations in a Si p-n junction could not be fully explained by any existing theory, further experiments involved testing a diode, remodeling it into a photocell, testing the latter, remodeling it back into diode, and testing again. The "anomalous behavior" of the current-voltage characteristic is explained by the properties of its working surface. Finally, breakdown conditions of Si diodes were studied: effect of source Si resistivity on the breakdown voltage, effect of temperature on the current and voltage at which the current-voltage characteristic collapses, and effect of temperature on the reverse branch of the current-voltage characteristic. It was found that the termal breakdown which usually occurs in Si p-n junctions is due to a "weak spot" on the surface of the

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ACCESSION NR: AT3002999

2

Junction; photographs and an oscillogram of the breakdown are submitted.
"Investigation of capacitance of the diffusion p-n junctions in question were
carried out by A. A. Lebedev in our laboratory." Orig. art. has: 21 figures,
59 formulas, and 2 tables.

ASSOCIATION: Akademiya nauk SSSR (Academy of Sciences SSSR) Akademiya nauk
Uzbekskoy SSR (Academy of Sciences SSSR) Tashkentskiy gosudarstvenny*y
universitet (Tashkent State University)

SUBMITTED: 00 DATE ACQ: 15May63 ENCL: 00
SUB CODE: 00 NO REF SOV: 006 OTHER: 006

Card 3/3

L 13061-63BDS/EWT(1)/EWP(q)/EWT(m)/EEC(b)-2 AFFTC/ASD/ESD-3
AT/JD/IJP(C)

ACCESSION NR: AT3003007

S/2927/62/000/000/0220/0224

65
62

AUTHOR: Lebedev, A. A.; Tuchkevich, V. M.

TITLE: Investigation of p-n junction capacitance as function of temperature and frequency [Report of the All-Union Conference on Semiconductor Devices held in Tashkent from 2 to 7 October 1961]

SOURCE: Elektronno-dy*rochny*ye perekhody* v poluprovodnikakh. Tashkent, Izd-vo AN UzSSR, 1962, 220-224

TOPIC TAGS: germanium diode capacitance, silicon diode capacitance

ABSTRACT: Some theoretical works dealing with the junction capacitance are reviewed, and a source formula for admittance of a p-n junction is selected. Authors' experiments are described with the following semiconductor devices: (1) n-Ge diodes with a resistivity of 50-60 ohm/cm; the alloy junction area is 5-7 sq mm; (2) same, but the resistivity is 30-40 ohm/cm and the area is 3 sq cm; (3) diffusion-type Si rectifiers with a p-n junction area of 3 sq cm. The source Si had n-type conductance and a resistivity of 30-40 ohm/cm. The capacitances were measured by a bridge method at 20-700 kc. Capacitance vs.

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L 13061-63

ACCESSION NR: AT3003007

frequency curves for various applied voltages are presented, as well as a number of auxiliary curves serving to compute the capacitance. It is inferred that the p-n junction capacitance of Ge and Si (alloy or diffusion) devices depend on both the temperature and the frequency. The capacitance is reliably described by the Tolpy*go and Rashba formula (ZhTF., 25, 1335, 1955). Orig. art. has: 6 figures and 5 formulas.

3

ASSOCIATION: Akademiya nauk SSSR (Academy of Sciences SSSR); Akademiya nauk Uzbecksroy SSR (Academy of Sciences UzSSR); Tashkentskiy gosudarstvenny*y universitet (Tashkent State University)

SUBMITTED: 00 DATE ACQ: 15May63 ENCL: 00

SUB CODE: 00 NO REF Sov: 005 OTHER: 003

Card 2/2

L 12827-63 EWT(1)/EWG(k)/EWP(q)/EWT(m)/BDS/T-2/EEC(b)-2/ES(t)-2
AFFTC/ASD/ESD-3 Pz-4/Pm-4 JD/LJR(C)
ACCESSION NR: AT3003023

S/2927/62/000/000/0295/0300

AUTHOR: Tuchkevich, V. M.; Uvarov, A. I.; Yakovchuk, N. S.

77

TITLE: Fluctuations of the reverse conductance in germanium and silicon rectifiers
[Report at the All-Union Conference on Semiconductor Devices, Tashkent, 2-7 Oct.,
1961]

SOURCE: Elektronno-dy*rochnyye perekhody* v poluprovodnikakh. Tashkent, Izd-vo
AN UzSSR, 1962, 295-300

TOPIC TAGS: germanium rectifier; silicon rectifier

25

ABSTRACT: Continuous operation of high-power germanium rectifiers (including the industrial water-cooled VG-500, 500 amp, 100 v type) was investigated. Due to visible surface short-circuits, the Soviet rectifiers broke down at any time, from a few minutes to a few months of continuous operation. It was found that a continuously applied reverse voltage of 100 v dc causes failure while a short-time 200 v is safe. Further studies revealed that the breakdown was connected with fluctuations of the reverse conductivity, and the latter was due to the presence of moisture on the rectifier surface. Fluctuations were accurately measured, and

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ACCESSION NR: AT3003023

the corresponding curves are presented in the article. The following recommendations are offered: (1) each branch of the rectifying circuit should include at least two Ge rectifiers in series; (2) a high-resistance voltage divider should be used. The authors consider their work as preliminary. Orig. art. has: 4 figures and 2 formulas.

ASSOCIATION: None

SUBMITTED: OO

SUB CODE: PH, GE

DATE ACQ: 15 May 63

NO REF SOV: 000

ENCL: 00

OTHER: 000

Card 2/2

9.2150

44273

S/105/62/000/012/002/003

E194/E155

AUTHORS: Alferov, Zh.I., Tuchkevich, V.M., and Trukan, M.K.

TITLE: The p-n junction temperature in germanium power rectifiers during the forward half-cycle

PERIODICAL: Elektrichestvo, no.12, 1962, 64-66

TEXT: The temperature of the p-n junction in semiconductor rectifiers may determine their failure on overload. The temperature function of the forward voltage drop is a better criterion than that of the reverse saturation current because the latter cools the p-n junction. A family of V-A characteristics is determined at different temperatures by applying current impulses to the rectifier. If the pulse characteristics are correctly chosen there is no heating of the p-i-n structure by the passage of current and no phase displacement between current and voltage due to rectifier diffusion capacitance. The thyratron pulse-generator circuit that was used delivered a sinusoidal voltage wave with an overall duration of 300 microseconds and with flattened peak lasting about 20 microseconds. Peak currents of up to 1000 A were delivered with a pulse-recurrence frequency of

Ca: Card 1/2

S/170/62/005/006/004/009
B104/B102

AUTHORS: Zabelina, L. G., Nikitina, G. V., Romanenko, V. N.,
Tuchkevich, V. M.

TITLE: Effect of heat abduction through the end of an ingot on zone melting

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, v. 5, no. 8, 1962, 81-83

TEXT: The zone levelling of the impurity concentration distribution in Ge is studied. The germanium samples were purified by zone melting and then alloyed with various impurities. The composition was checked by measuring the resistivity and the Hall-emf. After some cycles of zone levelling the impurity distribution was measured (Fig. 1), which showed that the position of the zone strongly influences the impurity concentration. This is related to the heat balance in zone levelling. To ensure regular conditions the adoption of annular ingots is recommended. ✓
There is 1 figure. ✓

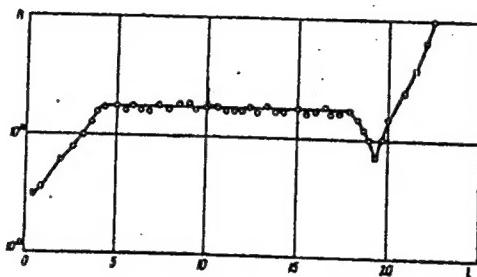
Card 1/2

Effect of heat abduction through the end...B104/B102 S/170/62/005/008/004/009

ASSOCIATION: Fiziko-tehnicheskiy institut AN SSSR imeni A. F. Ioffe, g.
Leningrad (Physicotechnical Institute AS USSR imeni A. F.
Ioffe, Leningrad)

SUBMITTED: December 2, 1961

Fig. 1. Impurity distribution n (cm^{-3}) over the length l (cm) of a crystal.



Card 2/2

Negative magnetoresistivity in hexagonal, n-type silicon carbide.
V. Mirzabayev, V. M. Tuchkevich, Yu. V. Shmartsev (10 minutes).

Structure and electrical properties of the system CdSe-HgSe.
M. V. Kot, V. A. Mshenskiy.

Structure and electrical properties of the system HgTe-ZnTe.
S. A. Danilyuk, M. V. Kot.

Structure and electrical properties of the system ZnSe-HgSe.
M. V. Kot, A. V. Simashkevich.

Report presented at the 3rd National Conference on Semiconductor Compounds,
Kishinev, 16-21 Sept 1963

L 18042-63
ACCESSION

QUESTION NO.: 442-62
AUTHORS: Mirzabayev, M.; Tuchik
SOURCE: Fizika tverdogo tel.
TITLE: Negative magnetoresistance
TAGS: band, iiquirite, auto

AFFTC/ASD

APPROVED FOR RELEASE

Card 1/2

L 18042-63

ACCESSION NR: AP3001282

different mobilities. For samples with higher concentration of impurities, decrease in resistivity is probably associated with change in effectiveness of scattering in the magnetic field. If the scattering occurs at unordered spin moments of impurity centers, then (in a magnetic field) the orientation of spins should be ordered, and the effectiveness of scattering should decline. "In conclusion, the authors express their thanks to V. S. Vyazovkin and I. A. Chayka for aid in the work." Orig. art. has: 7 figures and 1 table.

ASSOCIATION: Fiziko-tehnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad
(Physical and Technical Institute, Academy of Sciences, SSSR)

SUBMITTED: 21Jan63

SUB CODE: PH

DATE ACQ: 01Jul63

NO REF SOV: 003

ENCL: 00

OTHER: 012

Card 2/2

TUCHKEVICH, Vladimir Maksimovich

[Semiconductor power rectifiers] Moshchnye poluprovodnikovye vypriamiteli. Leningrad, Leningradskii dom nauchno-tehnicheskoi propagandy, 1964. 31 p. (Poluprovodniki, no.7) (MIRA 17:9)

12/20 Ac. -

1955年1月24日

TCFL 1A5: semiconductor converter, semiconductor gate, inverter / VKE 207
silicon rectifier, VKE

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

4 12429-65

ACCESSION NR: AP4046584

1960-1964

1960-1964

evaluated at all stages of its development. An AC voltage applied to the control electrode produced DC rectification from half to full power, while a pulse signal

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APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

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L 12429..65

Card u/c

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7

L 12420-55

ACCESSION NR: AP14046584

ENCLOSURE : 02

1 - WILLIAM BALOG,
2 - WITNESS.

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DATE 08-31-2001 BY SPK FOR CIA-DOCS

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"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7

THE VOLT-AMPERE CHARACTERISTICS OF THE TUBES AT 77, 205, AND 307K

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A. ZFS MR 4K

SWING ROLL

150

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AMERICAN HERITAGE

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

SOURCE: *Plastika Everdaga teis, v. 6, no. 9, 1964, 2673-2682*

TOPIC TAGS: silicon carbide, nitride silicon carbide, galvanomagnetic properties, electrical conductivity, thermal conductivity, insulation

ABSTRACT: Electrical resistance was measured, first, for the first time, in the range of temperatures from 10°K to 100°K, and second, at 77°K with a three-dimensional orientation of 10⁻⁸ cm². Green plastic insulators were used as samples.

ACCESSION NR: AP 60649 JR

L 16337-65 EWT(1)/EPA(s)-2/EWT(m)/EWT(m) 10/18/1964
ESD(gsl)/SSD/AFW/

ACCESSION NR: AP5000682

S/0181/64/006/012/3718-3721

AUTHORS: Mirzabayev, M.; Tuchkevich, V. M.; Shmartsev Yu. V.

TITLE: Piezo- and magnetoresistance in n-type germanium

SOURCE: Fizika tverdogo tela, v. 6, no. 12, 1964, 3718-3721

TOPIC TAGS: germanium, magnetoresistance, piezoresistance, spin, impurity center

ABSTRACT: The authors measured the piezoresistance of dislocation-free samples of n-type germanium doped with antimony, with carrier densities from 2×10^{17} to 10^{19} cm^{-3} . The piezoresistance of the samples is found to increase with carrier density. The magnetoresistance of the samples is also measured at various magnetic field strengths. Both the piezoresistance and magnetoresistance of the samples at low temperatures, in tensile stresses, pass through a minimum, and

Card 1/3

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2000

ACCESSION NR: AP86-144

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

L 16337-65

ACCESSION NR: AP5000682

ASSOCIATION: Fiziko-tehnicheskiy institut im. A. F. Ioffe AN
SSSR (Physicotechnical Institute AN SSSR)

SUBMITTED: 07Jul64

ENCL: 00

SUB CODE: SS, EM

NR REF SOV: 002

OTHER: OC6

Card 3/3

ABSTRACT: The negative magnetoresistance at low temperature previously observed in various semiconductors has been investigated in the

ity, ρ , Hall constant, carrier concentration, and electron mobility

ANALYST: [REDACTED] ANALYST: [REDACTED]

Temperature dependence of $\tau_{1/2}$ and the rate constant was shown to be exponential for all reactions in the range of weakly ionizing temperatures.

L 11893-66 EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/GG

ACC NR: AT6002249

SOURCE CODE: UR/2564/65/006/000/0193/0198

AUTHOR: Golubev, L. V.; Tuchkevich, V. M.; Shmartsev, Yu. V.

ORG: none

TITLE: Growing of heavily doped dislocation free germanium single crystals

SOURCE: AN SSSR. Institut kristallografii. Rost kristallov, v. 6, 1965, 193-198

TOPIC TAGS: single crystal growing, germanium single crystal, antimony, gallium, crystal dislocation

ABSTRACT: After discussing the effect of the conditions of growing single crystals by Czochralski's method on the dislocation density, the authors discuss the technique which they used to grow germanium single crystals doped with Sb or Ga and relatively free of dislocations. Two types of apparatus were employed: one for growing small-diameter crystals in a hydrogen atmosphere, and another for growing crystals up to 30 mm in diameter in a vacuum. The dislocation density was measured with an MBI-8 microscope after alkaline etching of polished sections. Fifteen germanium single crystals containing impurities in concentrations from 10^{17} to 10^{19} cm^{-3} for Sb and from 10^7 to $21,44,55$

Card 1/2

L 11893-66

ACC NR: AT6002249

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 $6 \times 10^{19} \text{ cm}^{-3}$ for Ga were grown. The dependence of dislocation mobility on the concentration of Sb in Ge was studied at 290 and 4.2K. The mobilities observed at 4.2K, up to $1100 \text{ cm}^2/\text{V sec}$ in samples with impurity concentrations in excess of 10^{18} cm^{-3} , were the highest of all obtained thus far. Orig. art. has: 5 figures and 2 formulas.

SUB CODE: 20/J/V SUBM DATE: none / ORIG REF: 013 / OTH REF: 017

BC
Card 2/2

L 41597-66 EAT(l)/EAT(n)/T/SMP(t)/ETI IJH(c) JD
ACC NR: AP6018550 SOURCE CODE: UR/0181/66/008/006/1851/1858

AUTHOR: Polyanskaya, T. A.; Sikharulidze, G. A.; Tuchkevich, V. M.; Shmartsev, Yu. V.

ORG: Physicotechnical Institute im. A. F. Ioffe, AN SSSR, Leningrad (Fiziko-tehnicheskiy institut AN SSSR) 85

TITLE: Galvanomagnetic phenomena in CdSnAs₂ 84

SOURCE: Fizika tverdogo tela, v. 8, no. 6, 1966, 1851-1858 B

TOPIC TAGS: cadmium compound, galvanomagnetic effect, magnetoresistance, energy band structure, conduction band, electron interaction, phonon interaction

ABSTRACT: The purpose of the work was to investigate galvanomagnetic phenomena in both n- and p-type samples in a broader temperature interval than in the past, so as to obtain information on certain parameters of the band structure and on the carrier scattering mechanisms in CdSnAs₂. The measurements were made on two n-type and two p-type single-crystal samples in the temperature interval from 1.3 to 450K, by a dc potentiometric method, using a system of glass cryostats in a magnetic field up to 12 kG. Analysis of the results shows that the experimental data do not contradict the theoretical ideas concerning the structure of the conduction band. It is assumed that the predominant scattering mechanism at T > 300K is interaction between electrons and optical phonons. The effective mass of the holes is found to be $m_p^* \approx 0.1m_0$, and the mobility ratio $b = \mu_n/\mu_p = 25$ (at T ≈ 300K). It is proposed that at low temperatures, appreciable contribution to the electric conductivity of p-type samples is

Card . 1/2

L 41597-66

ACC NR: AP6018550

made by fast holes. This assumption agrees with the experimentally observed complicated dependence of the magnetoresistance on the magnetic field induction. The authors thank A. Ya. Vul for great help with the measurements. Orig. art. has: 7 figures and 1 table.

SUB CODE: 20/ SURM DATE: 22Nov65/ ORIG REF: 006/ OTH REF: 010

ms
Card 2/2

L 38192-66 EWT(1)/EWT(m)/T/EWP(t)/ETI IJP(c) JD/JG
ACC NR AF6023613 SOURCE CODE: UR/0105/66/000/007/0056/0059

AUTHOR: Volle, V. M.; Grekov, I. V.; Kryukova, N. N.; Tuchkevich, V. M.;
Chelnokov, V. Ye.; Shuman, V. B.; Yakivchik, N. I.

ORG: Leningrad Physicotechnical Institute im. Ioffe, AN SSSR (Leningradskiy fiziko-tehnicheskiy institut, AN SSSR)

TITLE: VKDL-type diffused silicon avalanche power rectifiers

SOURCE: Elektrichestvo, no. 7, 1966, 56-59

TOPIC TAGS: semiconductor rectifier, silicon controlled rectifier

ABSTRACT: The development is reported of new types of diffused silicon power rectifiers. The rectifiers, which can be operated safely under high peak inverse voltages, differ from conventional diffused silicon rectifiers in that, due to special preparation of the p-n junction, the possibility of local electric breakdown at the intersection of the p-n junction with the surface is eliminated. Therefore, under peak inverse voltages, the process of avalanche breakdown takes place in the central section of the junction, while large power is dissipated in the inverse direction. In 1964, the Leningrad Physicotechnical Institute im. Ioffe, AS USSR, in cooperation with the "Elektrovypryamitel" Plant developed a series of such rectifiers bearing the designations VKDL-100, VKDL-200 and VKDL-350 for 100, 200, and 350 amp, respectively, and an 800-v operating voltage. The rectifying element of these devices is in the

Card 1/3

UDC: 621.382.3

ACC File AP6023613

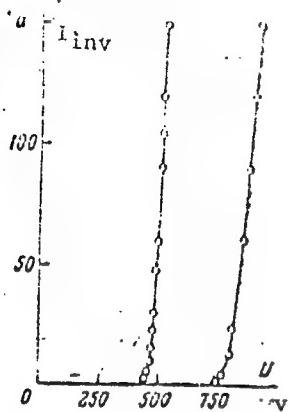


Fig. 1. Voltage-inverse current characteristic of the VKDL rectifiers

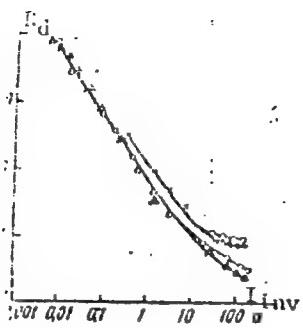


Fig. 2. Dependence of the dynamic resistance of the VKDL rectifiers on the inverse current

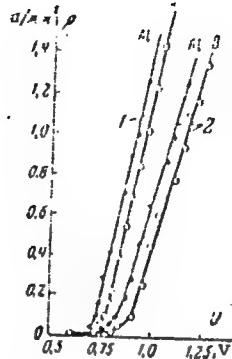


Fig. 3. Voltage-forward current characteristic of p-n junctions

form. of a 25-mm silicon plate with a p-n-n⁺ type conductivity. Two thermally compensating tungsten disks are pressed against the plate. A method of planar guard ring construction, described elsewhere (Haitz, R. M., A. Goetzberger, R. M. Scarlett,

Card 2/3

L 3017c-60

ACC NR: AP6023613

3

and W. J. Shockley, J. Appl. Phys., v. 34, 1963), was used to eliminate the possibility of surface breakdown. The p-n junctions were made by the method of phosphorus boron and aluminum diffusion. The boron p-n junction was 18 mm in diameter with a planar guard ring 2 mm wide. The thickness in the diffused layer in the central section of the silicon plate was 60—80 μ , and in the region of the guard ring, 120—160 μ . The thickness of the diffused layer formed by phosphorus on the side of the base contact was 20 μ . Typical voltage-inverse current characteristics of the rectifiers in the breakdown region at 500 and 800 v are shown in Fig. 1. The characteristics correspond to the central p-n junction. The breakdown voltage of the p-n junction in the guard ring exceeds that of the central p-n junction by 250—600 v depending on the initial silicon resistance. Dependence of the dynamic resistance of avalanche rectifiers on inverse current is shown in Fig. 2, and the voltage-forward current characteristic in Fig. 3. With respect to the forward voltage drop, the above devices are divided into three groups: those with a 0.4—0.5, 0.5—0.6, and 0.6—0.7 v forward voltage drop for a nominal current. The inverse current under nominal conditions for all rectifiers does not exceed 5 ma. The lifetime of the avalanche rectifiers is up to 25,000 hr. The number of thermal cycles ranging from -50 to +100°C should not exceed 5000 during the entire lifetime. The rectifiers can be connected either in series or in parallel. When connected in parallel, they should have equal forward voltage drops. Orig. art. has: 1 table and 8 figures.

[JR]

SUB CODE: 09/ SUBM DATE: 10May65/ ORIG REF: 003/ OTH REF: 001/ ATD PRESS:

5645

Card 3/3

ACC NR: AP7001892

SOURCE CODE: UR/0020/66/171/004/0830/0832

AUTHOR: Borshchevskiy, A. S.; Goryunova, N. A.; Sikharulidze, G. A.; Tuchkevich, V. M.; Shmartsev, Yu. V.

ORG: Physicomathematical Institute im. A. F. Ioffe, Akademii nauk SSSR (Fiziko-matematicheskiy institut im. A. F. Ioffe, Akademii nauk SSSR)

TITLE: Preparation and some properties of CdSnAs₂ semiconductor compound

SOURCE: AN SSSR. Doklady, v. 171, no. 4, 1966, 830-832

TOPIC TAGS: cadmium tin arsenide, arsenide single crystal, single crystal growing, single crystal property, zone refining

ABSTRACT: A method for growing crack-free CdSnAs₂ single crystals is described. The synthesis was carried out in a quartz ampoule and pure-argon atmosphere at a stoichiometric proportion of components and a temperature of 750°C. The obtained compound was then zone refined. Crystals up to 7 cm long and about 1 cm in diameter were grown from the zone-refined ingot by zone melting at 585—589°C with a molten zone speed of 0.8 cm/hr. The respective properties of the specimens cut from the middle and end portions of the single crystal were: Hall constant 80 and 3.7 cm³/coulomb.

Card 1/2

UDC: 537.311.33

ACC NR: AP7001892

resistivity $5 \cdot 10^{-3}$ and $4.9 \cdot 10^{-4}$ ohm·cm, electron concentration $7.8 \cdot 10^{16}$ and $1.7 \cdot 10^{18}/\text{cm}^3$, and mobility 16,000 and 7,650 $\text{cm}^2/\text{v}\cdot\text{sec}$. Orig. art. has: 1 figure and 1 table.

SUB CODE: 20/ SUBM DATE: 20Dec65/ ORIG REF: 003/ OTH REF: 006/ ATD PRESS: 5111

Card -2/2

L 30991-66 EWP(e)/EWT(m)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b) IJP(c) JD
ACC NR: AF6002888

SOURCE CODE: UR/0286/65/000/024/0045/0045

INVENTOR: Grekov, I. V.; Liniychuk, I. A.; Lebedeva, L. V.; Tuchkevich, V. M.;
Chelnokov, V. Ye.; Shuman, V. B.; Yakivchik, N. I.

ORG: none

TITLE: Method of creating a source of diffusion of aluminum in silicon. Class 21,
No. 176989 [announced by the Physical Engineering Institute im. A.F. Ioffe, AN SSSR]
(Fiziko-tehnichesky institut AN SSSR)

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 24, 1965, 45

TOPIC TAGS: aluminum, diffusion, aluminum diffusion, junction, pnp junction, npnnpn
junction, pnn junction, junction forming

ABSTRACT: This Author Certificate introduces a method of forming an aluminum source
for the diffusion of aluminum in silicon in an oxidizing atmosphere such as air. To
simplify the technique and accelerate the diffusion, aluminum in the form of $\text{Al}(\text{NO}_3)_3$
solution or of a mixture of aluminum-oxide powder with powder oxides of metals such
as tungsten, titanium, or tantalum is deposited by any well-known method on the sur-
face of silicon plates. In a variant of the above method, in order to obtain struc-
tures of the types p-n-p or n-p-n-p-n, the surface of silicon plate is first coated with
a boron or phosphorus compound and subjected to heat treatment. In a further variant
of the first and second methods, in order to form semiconducting structures of such

Card 1/2

UDC: 539.121.72.002.2: 621.382

I 30991-66

ACC NR: AP6002888

types as p-n-n+, one of the sides of the silicon plate is coated with an alcoholic solution of aluminum, boron, and nickel compounds, and the other side is coated with a solution of orthophosphoric acid in alcohol, followed by a heat treatment. [ND]

SUB CODE: 20,09 SUBM DATE: 05Mar64/ ATD PRESS: 4191

Card 2/2 LC

L 28897-66 ENI(m)/EWP(t)/ETI IJP(c) JD/WB
ACC NR: AP6014695

SOURCE CODE: UR/0105/66/000/005/0058/0061

AUTHOR: Dumanovich, A. N.; Yevseyev, Yu. A.; Tuchkevich, V. M.; Chelnokov, V. Ye.;
Yakivchik, N. I.

ORG: none

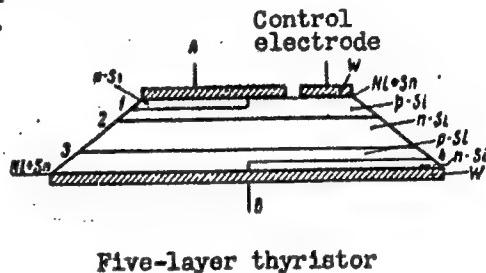
TITLE: VKDUS power silicon diffusion-type thyristors

SOURCE: Elektrichestvo, no. 5, 1966, 58-61

TOPIC TAGS: thyristor, power thyristor, semiconductor device/VKDUS thyristor

ABSTRACT: Some test results and nominal characteristics of Soviet-made VKDUS silicon diffusion-type power thyristors, developed in 1964, are reported. The thyristor (see figure) has a 5-layer n-p-n-p-n structure with outermost junctions shunted by metal contacts.

The junctions are prepared by successive diffusion of B, Al, P in a single-crystal (25-mm diameter, 0.35 mm thick) Si plate having a resistivity of 20-40 ohm·cm. Physical processes transpiring in the 5-layer structure are explained. Nominal peak voltages of VKDUS thyristors are 50-600 v. Nominal currents are 25-150 amp, depending on the type of cooling



UDC: 621.382.233

Card 1/2

L 28897-66

1

ACC NR: AP6014695

(natural, radiator, forced-draft, water). Forward voltage drop, 1.25--0.9 v.
Permissible overloads: 25% nominal current for 30 sec and 110% for 1 sec. Turn-on
time, 10 μ sec; recovery time, 25 μ sec or less. Operating frequency, up to 500 cps.
Ambient temperature -40 +110C; cooling-water temperature, 5-70C. Ambient humidity,
not over 98%; atmospheric pressure, 600--1500 torr. The thyristors are vibration-
and shock-proof; they are moisture- and corrosion-proof, but cannot operate in
chemically aggressive media. Orig. art. has: 7 figures and 3 tables. [03]

SUB CODE: 09 / SUBM DATE: 04Feb65 / ORIG REF: 004 / ATD PRESS: 5005

Card 2/2 CC

L 29954-66

ACC NR: AP6012478

SOURCE CODE: UR/0181/66/008/004/1159/1164

AUTHOR: Sikharulidze, G. A.; Tuchkevich, V. M.; Ukhanov, Yu. I.; Shmartsev, Yu. V.

ORG: Physicotechnical Institute im. A. F. Ioffe, AN SSSR, Leningrad (Fiziko-tehnicheskiy institut AN SSSR)

TITLE: Optical and magneto-optical phenomena in CdSnAs₂

SOURCE: Fizika tverdogo tela, v. 8, no. 4, 1966, 1159-1164

TOPIC TAGS: optic activity, cadmium compound, tin compound, arsenic compound, Hall effect, electric conductivity, absorption spectrum, magnetooptic effect, light polarization, light scattering, phonon scattering

ABSTRACT: The authors investigated the absorption and reflection spectra, the optical activity, and the birefringence of infrared radiation in the wavelength range 3-20 μ. The CdSnAs₂ crystals were obtained by directional crystallization and by zone growing with primer, from a melt synthesized in a quartz ampoule in an argon atmosphere. The Hall effect and the electric resistivity were measured in the temperature range 78-450K. Both n- and p-type crystals were measured. The reflection from samples with intrinsic conductivity (p-type, $n = 6.25 \times 10^{18} \text{ cm}^{-3}$) was practically independent of the wavelength. Samples with other impurity densities (n-type, $n = 2.6 \times 10^{18} \text{ cm}^{-3}$ and $3.5 \times 10^{18} \text{ cm}^{-3}$) showed minima at ~14.4 and 12.5 μ. At 130K, the reflection spectrum exhibited a minimum near 13 μ with and without a magnetic field. The absorption spectra showed a more complicated spectral dependence, wherein the short-wave

64
B

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L 29954-66

ACC NR: AP6012478

absorption depended little on the orientation of the plane of polarization, whereas the absorption spectrum in the region 0.16-0.30 ev changed appreciably with rotation of the plane of polarization. The measurements were made at 130 and 295K without and with a magnetic field (up to 25 kG). At 295K the width of the forbidden gap was 0.25 ± 0.01 ev, the dielectric constant of the lattice was 13.7 ± 0.6 . The Faraday effect was investigated in the wavelength range $4-11 \mu$ at 130 and 295K, from which the mean value of the effective mass near the Fermi level was determined (0.042 ± 0.005) m_0 . The wavelength dependence of the absorption coefficient was of the power-law type with exponent $-(2.50 \pm 0.07)$, indicating that the predominant scattering mechanism at room temperature is scattering by optical phonons. The authors thank Yu. V. Mal'tsev for great help with the work. Orig. art. has: 4 figures, 4 formulas, and 2 tables.

SUB CODE: 20/ SUBM DATE: 04Sep65/ ORIG REF: 004/ OTH REF: 014

Card 2/2 10

L 9572-66 EWT(1)/EWT(m)/EWP(t)/EWP(b) IJP(c) JD
ACC NR: AP5027440 SOURCE CODE: UR/0181/65/007/011/3437/3439
44, 55 44, 55 44, 55 49
AUTHOR: Mirzabayev, M.; Tuchkevich, V. M.; Shmatsev, Yu. V. B
44, 55
ORG: Physicotechnical Institute im. A. F. Ioffe AN SSSR, Leningrad (Fiziko-tehnicheskiy institut AN SSSR)
TITLE: Piezomagnetoresistance in β -germanium
27
SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3437-3439
21, 44, 55
TOPIC TAGS: germanium, piezomagnetic effect, magnetoresistance
ABSTRACT: Magnetoresistance is studied as a function of compressive mechanical stress up to $8 \cdot 10^8$ dynes \cdot cm $^{-2}$ in an antimony-doped specimen of germanium with an electron concentration of $1.74 \cdot 10^{17}$ cm $^{-3}$. Curves are given showing the effect of compressive mechanical stress on magnetoresistance and the effect of a magnetic field on piezoresistance. It was found that magnetoresistance increases with mechanical stress up to $2.5 \cdot 10^8$ dynes \cdot cm $^{-2}$ and becomes negative at higher stresses, approaching saturation as the magnetic field strength is increased. A transition to negative magnetoresistance takes place in the specimen at compressive stresses greater than $5 \cdot 10^8$ dynes \cdot cm $^{-2}$. Orig. art. has: 2 figures, 2 formulas.

SUB CODE: 20/ SUBM DATE: 10Jun65/ ORIG REF: 001/ OTH REF: 005

leah
Card 1/1

GREKHOV, I.V.; LINIYCHJK, I.A.; TUCHKEVICH, V.M.; CHELNOKOV, V.Ye.,
SHUMAN, V.B.; YAKIVCHIK, N.I.

Some applications of regulated silicon power rectifiers.
Elektrichesvo no.2:76-77 F '65. (MIRA 18:3)

L 3911-66 EWT(m)/EWP(t)/EWP(b) IJP(c) JD
ACCESSION NR: AP5018743

UR/0020/65/163/002/0338/0339

29
B

AUTHOR: Mirzabayev, M.; Tuchkevich, V. M.; Shmartsev, Yu. V.

TITLE: Negative magnetoresistance in n-type silicon

SOURCE: AN SSSR. Doklady, v. 163, no. 2, 1965, 338-339

TOPIC TAGS: silicon, semiconductor carrier, magnetoresistance

ABSTRACT: In view of the scanty amount of published data on the subject, the authors measured the magnetoresistance of n-type silicon by a standard dc potentiometer method, in magnetic fields up to 16.5 KG. The measurements accurate to +0.01%, were made on samples of doubly-cruciform shape at temperatures 4.2 and 1.7OK. Typical plots of the negative magnetoresistance against the electron density are shown in Fig. 1 of the enclosure. The higher values of magnetoresistance observed by H. Roth et al. (Phys. Rev. Lett. v. 11, 328, 1963) are attributed to the presence of uniaxial tension in their sample. This report was presented by V. P. Konstantinov. Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Fiziko-tehnicheskiy institut im. A. F. Ioffe AN SSSR (Physicotechnical Institute AN SSSR)

Card 1/3

L 3911-66

ACCESSION NR: AP5018743

SUBMITTED: 12Dec64

ENCL: 01

SUB CODE: 88

NR REF SOV: 000

OTHER: 002

Card 2/3

L 3911-66

ACCESSION NR: AP5018743

ENCLOSURE: 01

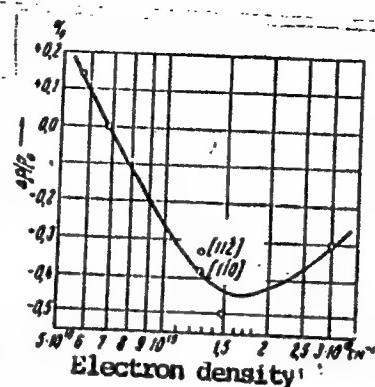
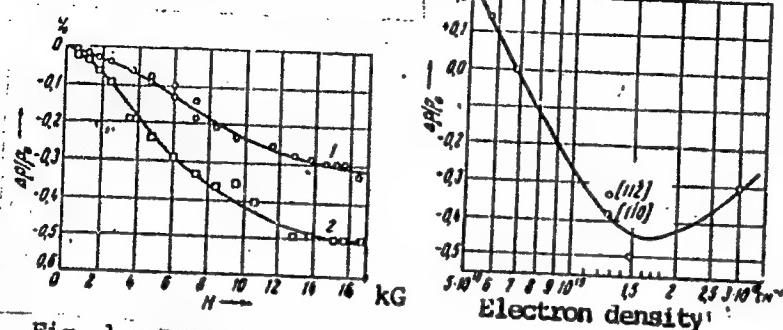


Fig. 1. Dependence of the negative magnetoresistance of n-type silicon on the magnetic field intensity (left) and on the carrier density (right).

Card 3/3

MIRZABAYEV, M.; TUCHKEVICH, V.M.; SHMARTSEV, Yu.V.

Piezoelectric resistance and magnetoresistance in n-germanium.
Fiz. tver. tela ó no.12:3718-3721 D '64 (MIRA 18:2)

1. Fiziko-tehnicheskiy institut imeni Ioffe AN SSSR, Leningrad.

MIRZABAYEV, M.; TUCHKEVICH, V.M.; SHMARTSEV, Yu.V.

Negative magnetic resistance in n-silicon. Dokl. AN SSSR 163 no.2:338-
339 Jl '65. (MIRA 18:7)

1. Fiziko-tehnicheskiy institut im. A.F.Ioffe AN SSSR. Submitted
December 31, 1964.

"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7

TUCHKEVICH, V.M., doktor fiz.-matem.nauk

Semiconductor converters, Vest. AN SSSR 34 no.9134-47 S. 16.
(MIRA 17.10)

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7

L 52785-65 ENT(1)/EST(m)/T/EWP(t)/EWP(b)/ENA(h) Pz-o/Peb IJP(c) JD/AT
ACCESSION #: AF5010742 UNIT/0181/65/007/004/1235/1236

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

TUCHKEVICH, V.V.; ROMANOV, V.A.; TOTUBALINA, M.G.

Study of neutron-deficient Lu isotopes using a prism
spectrometer equipped with quadrupole lenses. Izv. AN SSSR.
Ser.fiz. 27 no.2:246-248 F '63. (MIRA 16:2)

1. Fiziko-tehnicheskiy institut im. A.F.Ioffe AN SSSR.
(Beta-ray spectrometer) (Lutetium-isotopes--Decay)

TUCHKEVICH, V.V.; ROMANOV, V.A.; IODKO, M.G.

Relative intensity of conversion electrons in Lu¹⁷⁰ and Lu¹⁷².
Izv. AN SSSR Ser. fiz. 24 no.12:1457-1464 D '60. (MIRA 13:12)
(Lutetium—Isotopes)

IODKO, M.G.; ROMANOV, V.A.; TUCHKEVICH, V.V.

Relative intensity of conversion electrons in Lu¹⁶⁹ and Lu¹⁷¹. Izv.
AN SSSR Ser. fiz. 24 no.12:1465-1469 D '60. (MIRA 13:12)

1. Fiziko-tehnicheskiy institut AN SSSR.
(Lutetium—Isotopes)

TUCHKEVICH, V. V.

21(7)
 AUTHORS: Tolman, V. M., Beschverilov, L. Ya., SOI/56-37-1-62
 Frechenskiy, N. K., Rosner, V. A., Tuchkevich, V. V.
The Multipolarities of γ -Transitions in Tm^{169}
 Periodicals:

Khurnal Akademiroy i Nauk SSSR fizika i matematika fizika, 1959,
 Vol. 37, No. 5, pp. 639-642 (Russian)

ABSTRACT: The γ -spectrum and the spectrum of the conversion electrons of excited Tm^{169} -nuclei has already been investigated by several authors. In the present paper the level scheme of the considerably deformed Tm^{169} -nuclides and its particular characteristics are first discussed (Fig. 1, Fig. 4). In the following, the authors give several results obtained by measurements of the ratios of γ -conversion coefficients to the Lyman-alpha's of Tm^{169} ($\lambda_1 = 65, 94, 110, 130.5, 177$ and 198 kev). Further, the multipolarities of the transitions were determined and for mixed radiations the intensities of the components was determined. The intensities of the conversion lines were measured by means of β -spectrometers. All sources of this type lay on an aluminum foil was used.

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The production of this source is described in detail: A Tm^{169} salt target was irradiated with 600 Mev protons on the synchrocyclotron of the Ob'predmenny Institute (radioisotope laboratory) of Nuclear Research. The rare-earth elements produced were separated by ion exchange (using the cationite KM-2) and subjected to a process of preparation which is described. Finally, a Lu fraction (Lu^{170}) was obtained on the aluminum foil, which gives after into Tm^{169} with a half life of ~ 20 . Figure 2 shows the conversion lines of 177 kev γ -quanta onto the levels of Tm^{169} , and figure 3 shows the same for 198 kev γ -quanta. In both cases also the $L_{1/2}^{+}$ and $L_{1/2}^{-}$ series are distinctly marked beside the steep Γ -peak. The results obtained by these investigations are shown in a table. Thus, the splitting was obtained for the 177 kev transition:
 $L_{1/2}^{+}/L_{1/2}^{-} = (0.24 \pm 0.01) : (0.37 \pm 0.006) ; L_{1/2}^{+}/L_{1/2}^{-} = 0.75 \pm 1.05 \pm 0.01$.

Card 2/3

For the 198 kev transition the following is given:
 $L_{1/2}^{+}/L_{1/2}^{-} = (0.13 \pm 0.002) : (0.36 \pm 0.001) ; L_{1/2}^{+}/L_{1/2}^{-} = 0.35 \pm 1.75 \pm 0.01 ; L_{1/2}^{+}/L_{1/2}^{-} = 0.95 \pm 1.05 \pm 0.01$. There are 3 figures, 1 table and 15 references, 8 of which are Soviet.

Leninградский физико-технический институт Академии наук ССР
 (Leninograd Physico-Technical Institute of the Academy of Sciences, USSR)

Submitted: April 9, 1959

Card 3/3

KEL'MAN, V.M.; METSKHVARISHVILI, R.Ya.; PREOBRAZHENSKIY, B.K.;
ROMANOV, V.A.; TUCHKEVICH, V.V.

Investigation of spectra of conversion electrons of neutron
deficient lutetium isotopes. Zhur. eksp. i teor. fiz. 35 no.5:
1309-1310 N '58. (MIRA 12:3)

1.Leningradskiy fiziko-tehnicheskiy institut AN SSSR.
(Lutetium--Spectra)

"APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7

APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

S/048/60/024/012/003/011
B019/B056

AUTHORS: Tuchkevich, V. V., Romanov, V. A., and Iodko, M. G.

TITLE: Relative Intensities of Lu¹⁷⁰ and Lu¹⁷² Conversion Electrons

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,
Vol. 24, No. 12, pp. 1457-1464

TEXT: The present paper was read at the 10th All-Union Conference on Nuclear Spectroscopy, which was held in Moscow from January 19 to January 27, 1960. The authors investigated the relative intensities of the conversion lines by means of a spectrometer with double focusing, a line half-width of from 0.25-0.35%, and a solid angle of 0.1-0.2%. Lutecium fraction, which had been separated from a Ta target irradiated with 660-Mev protons was used as a source. Table 1 shows the energies and the relative intensities of conversion lines in the Yb¹⁷² spectrum and the energies and relative intensities of the γ -lines, which had been taken from a paper by Dilman et al. (Ref. 2). On the basis of these data, the internal conversion coefficients for a number of transitions were calculated, and the multiplicities of these transitions could be estimated.

Card 1/6

Relative Intensities of Lu¹⁷⁰ and Lu¹⁷²
Conversion Electrons

S/048/60/024/012/003/011
B019/B056

There follows a detailed discussion of these data, and a discussion of experimental results, which the authors consider to be in need of improvement. The investigations of the transition energies and the conversion electron intensities of Yb¹⁷⁰ yielded rather inexact results. Partly, the occurrence of a large number of weak lines with short half-lives in the conversion electron spectrum is to blame for this. Table 5 gives the transition energies and the intensities of the conversion lines of Yb¹⁷⁰, the doubtful data being shown in brackets. A possible variant of the decay scheme is shown in Fig. 2. There are 2 figures, 5 tables, and 12 references: 6 Soviet, 5 US, and 1 Danish.

Text to Table 1: 1) Transition energy; 2), 3), and 4) Conversion line intensities; 5) Energy according to data by Dilman; 6) Intensities according to data by Dilman in units used by the authors; 7) Conversion coefficient; 8) Total intensity of conversion lines;
Text to Table 5: 1) Transition energy; 2) and 3) Conversion line intensities; 4) Total intensity; 5) Multiplicity.

Card 2/6

Lu^{m2} f.6.7m (~6,7 days)

Card 3/6

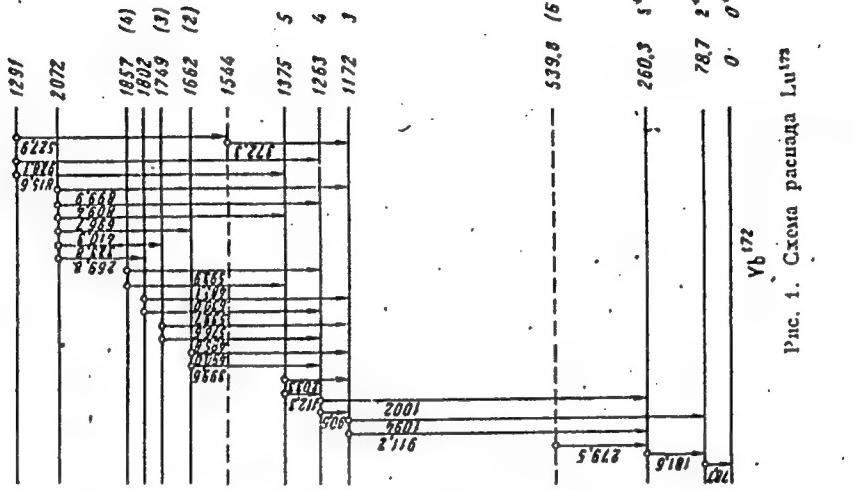


Fig. 1. Crema pacuana Lu^{m2}

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L₁₁ = 200 (~2 days)

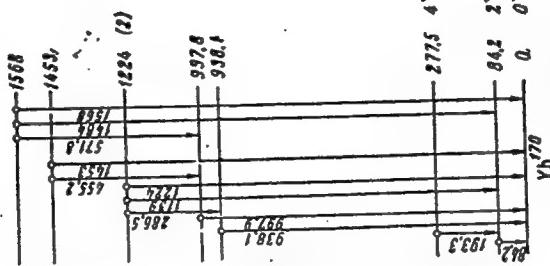


Рис. 2. Возможный вариант
схемы расчёта Lutjus

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E, keV	I_K^*	I_L	I_M	\sqrt{I}	Интенсивность по [2] в пикоамперах
78.7	1300±100	2700±60	700±100	700±100	1557
90.6	500±30	600	140±10	140±10	750
112.3	195±5	100	25±5	25±5	806
161.6	13.3±0.8	11.1±0.3	24.5±0.5	24.5±0.5	528
203.3	36.5±0.4	2.3±0.2	5.8±0.3	<1.7	-
269.8	13.3±0.4	1.1	-	-	-
279.5	4.5	-	-	-	-
318.8	1.3	-	-	-	-
323.8	8.6±0.5	4.7±0.4	0.8	325	556
372.3	6.3±0.1	1.2	-	370±5	-
377.4	1.2	-	-	-	-
399.5	1.0±0.2	-	-	-	-
410.3	4.9±0.3	-	-	-	-
482.1	1.2±0.1	0.7	-	-	-
485.8	1.2±0.15	-	-	-	-
490.0	3.5±0.4	-	-	-	-
527.9	4.5±0.2	-	-	-	-
539.7	1.7	0.3	1.4±0.2	525±10	528
576.6	0.5	-	-	-	-
594.0	0.74	-	-	-	-
626.4	1.6±0.2	0.4	-	-	-
630.0	0.65	<0.58	-	-	-
696.7	3.6±0.3	0.8±0.1	0.38	-	-
809.4	6.2±0.2	1.2±0.1	0.47	820±7	258
815.6	0.71	-	-	-	-
839.9	10.1±0.2	1.5±0.2	0.36	900±5	722
911.2	3.0±0.1	0.54	0.2	-	-
928.1	1.2	-	-	-	-
986.3	0.4	<0.2	-	-	-
1002	0.9±0.2	<1.0	-	-	-
1094	7.2±0.2	1.4±0.1	-	-	-
1113	0.54	<0.40	1090±10	-	1446

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B019/B056

Card 5/6

$T_{\alpha K}$	I_K^{**} посл.	ϵ	$T_{\alpha K}$	I_K^{**} посл.	ϵ
0,81	—	7350	—	—	—
—	—	1550	—	—	—
0,24	—	~130	—	—	—
6,9(-2)	—	1100	—	—	—
—	—	310	—	—	—
—	—	~74	—	—	—
(560)	—	—	—	—	—
—	—	—	~390	—	—
—	—	—	30(-220)	—	—
—	—	—	15(-230)	—	—
—	—	—	50(+380)	—	—
—	—	—	20(+120)	—	—
—	—	—	—	30(+200)	—
—	—	—	—	2,4(-2)	—
—	—	—	—	—	(260)
—	—	—	—	—	~200
—	—	—	—	—	—
—	—	—	—	—	1,4(-2)
—	—	—	—	—	—
—	—	—	—	—	155-1960
—	—	—	—	—	—
—	—	—	—	—	5,0(-3)

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B019/B056

Table 5

Энергия перехода, keV*	I_K^{**}	I_L	Полная интенсивность	Музыкальность	Энергия перехода, keV*	I_K^{**}	I_L	Полная интенсивность	Музыкальность
84,2	1400±200	7600	14300	E2	511,7	1,4	—	—	—
184,5	14,9	—	—	—	543,9	~7	—	—	—
193,3	100	59	760	E2	(560,9)	1,2	—	—	—
222,7	11±2	~3	—	—	571,8	2,4	—	—	—
279,4	—	—	~4	—	756,2	~0,3	—	—	—
282,9	8,5±0,3	1,8	—	—	837,1	~2,1	—	—	—
286,5	3,3±0,4	—	—	—	938,1	3,7±0,1	—	—	—
332,1	~3,5	<1,8	—	—	983,2	~5	—	—	—
(386,3)	1,4	—	—	—	997,9	~2	—	—	—
388,7	2,7	<1,3	—	—	(1103)	1,3±0,1	—	—	—
396,1	4,6	<2	—	—	1139	2,3±0,1	—	—	—
416,8	1,5	—	—	—	1224	2,1±0,3	—	~1000	—
419,8	—	—	~1,8	—	1281	2,0±0,1	—	~1000	—
455,2	~3	<1,2	—	—	1454	14,0±0,3	1,8	1500+18000	—
487,3	1,7	—	—	—	1484	8,4±0,2	1,5	1000+13000	—
—	—	—	—	—	1568	1,8	—	200+3000	—

Card 6/6

S/048/60/024/012/004/011
B019/B056

AUTHORS:

Iodko, M. G., Romanov, V. A., Tuchkevich, V. V.

TITLE:

Relative Intensities of Lu¹⁶⁹ and Lu¹⁷¹ Conversion Electrons

PERIODICAL:

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960,
Vol. 24, No. 12, pp. 1465-1469

TEXT: The present paper was read at the 10th All-Union Conference on Nuclear Spectroscopy, which was held in Moscow from January 19 to January 27, 1960. The conversion electron spectra of Lu¹⁶⁹ and Lu¹⁷¹ were investigated by means of a β -spectrometer with double focusing, the relative line width amounted to 0.25-0.35%. The two sources were obtained by irradiation of Ta targets with 660-Mev protons on the synrocyclotron of the OIYaI (Joint Institute of Nuclear Research), the Lu fraction was separated by ion exchange and applied onto an Al foil. As the Lu¹⁶⁹ and Lu¹⁷⁰ half-lives are nearly equal, the lines of these isotopes could not be separated. Table 1 shows the relative intensities of the conversion lines

Card 1/5

Relative Intensities of Lu¹⁶⁹ and Lu¹⁷¹
Conversion Electrons

S/048/60/024/012/004/011
B019/B056

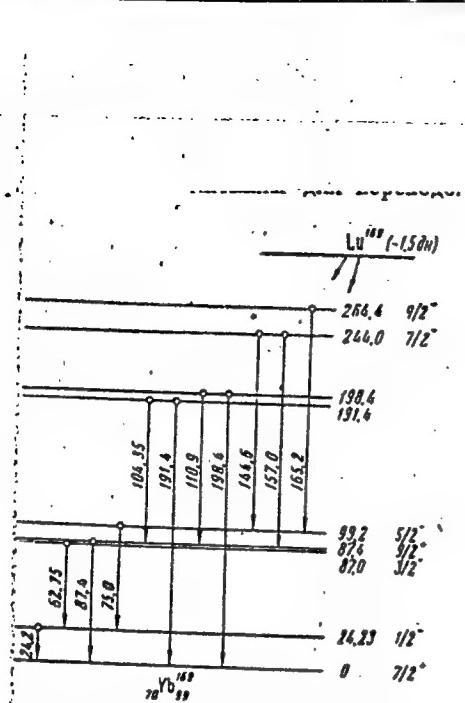
of Lu¹⁶⁹, Table 3 shows the Yb¹⁷¹ transition energies and relative intensities of the conversion electrons. The decay schemes already known are shown in Figs. 1 and 2. L. A. Sliv and I. M. Vand (Ref. 5) are mentioned. The authors thank V. M. Kel'man for his interest. B. S. Dzhelepov and L. K. Peker for valuable comments, as well as G. L. Vlasenko and V. P. Belov for their assistance in the measurements. There are 2 figures, 4 tables, and 8 references: 5 Soviet, 2 US, and 1 Danish.

ASSOCIATION: Fiziko-tehnicheskiy institut Akademii nauk SSSR (Institute of Physics and Technology of the Academy of Sciences USSR)

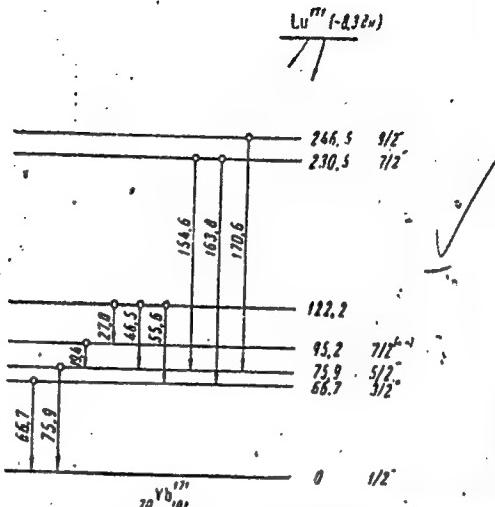
Text to Table 1: 1) Energy of the transition line; 2), 3), and 4) are the relative intensities of the Lu¹⁶⁹ conversion lines.

Text to Table 2: 1) Yb¹⁷¹ transition energies; 2), 3), and 4) relative intensities of the conversion electrons.

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Рис. 1. Схема распада Lu¹⁵⁹

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S/048/60/024/012/004/011
B019/3056Рис. 2. Схема распада Lu¹⁷¹

S/048/60/024/012/004/011
B019/B056

Таблица 1
Относительные интенсивности квазареносных линий Lu¹⁸⁰

λ E, keV	2 K	3 L	4 M	λ E, keV	2 K	3 L	4 M	λ E, keV	2 K	3 L	4 M
24,2	—	9000	—	227,9	—	12	—	563	9	—	—
62,6	—	11300	—	243	—	22	9	590,8	—	4	—
87,3	18100	—	—	258	112	—	—	634,6	15	—	—
91,8	3800	—	—	290,9	100	20	7,4	646,9	3,5	—	—
110,9	—	1000	250	369,1	102	—	—	655,4	1,4	—	—
144,5	—	188	105	378,3	205	30	11	707,4	3,6	—	—
150,8	830	530	—	403,9	12	—	—	820,9	8	—	—
164,9	1100	790	130	458,5	57	9	—	879,3	0,7	—	—
186,5	130	—	—	470,4	—	6	—	960,6	55	8,7	—
191,5	1700	350	—	479,5	16	4	—	1061	28	—	—
198,6	200	—	—	491,7	—	9	—	1072	.24	—	—
				548	17	3	—	1079,5	6,4	—	—

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S/048/60/024/012/004/011
B019/B056

Энергии переходов Yb^{171} и относительные интенсивности конверсионных электронов

<i>E</i> , keV	<i>K</i>	<i>L</i>	<i>M</i>	<i>E</i> , keV	<i>K</i>	<i>L</i>	<i>M</i>
55,63	—	5500	—	712,6	10	2,7	1,4
66,8	—	14600	—	739,4	100	16	3
72,38	—	3000	—	767,2	8,5	—	—
75,97	2800	41000	8700	780,0	9	—	—
85,55	3800	—	—	839,3	26	1,5	—
91,28	1500	—	—	853,9	—	—	—
498,4	5	—	—	986,0	2	—	—
517,7	9	4	—	1020	2,5	—	—
626,2	11	2	—	1029	1	—	—
666,8	29	5	3	1037	2	—	—
688,8	6,5	—	—	1042,9	—	—	—
				1102,8	2	—	—

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APPROVED FOR RELEASE: 08/31/2001

CIA-RDP86-00513R001757330008-7"

TUCHKEVICH, V. V., ROMANOV, V. A., METSKIVARISHVILI, R. Ya., and KELMAN, V. M.
Physical-Tehnical Institute, USSR AS, Leningrad

"Investigation of Conversion Lines in the β -Spectrum of Ir¹⁹²,"
Journal of Nuclear Physics, Amsterdam, No. 4, pp 240-247, 1957.

21(8)

SOV/56-35-5-51/56

AUTHORS: Kel'man, V. M., Metskhvarishvili, R. Ya., Preobrazhenskiy, B.K.,
Romanov, V. A., Tuchkevich, V. V.TITLE: The Investigation of the Spectrum of Conversion Electrons of
the Isotopes of Lutetium With Neutron Deficit (Issledovaniye
spektra konversionnykh elektronov neytronodefisitnykh
izotopov lyutetsiya)PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,
Vol 35, Nr 5, pp 1309-1310 (USSR)ABSTRACT: The investigation of the radiation of greatly deformed nuclei
furnishes material for the further development of the collective
nuclear model. It is just from this point of view that the
isotopes of lutetium are of interest. Recently several papers
(Refs 1-4) have been published which deal with lutetium
isotopes with neutron deficit, but the data given by these
papers do not convey a clear idea of the decay of these iso-
topes. Additional investigations are therefore necessary. The
authors of the present paper investigated the conversion spec-
trum of the isotopes of a lutetium fraction, which had been
separated from a tantalum target irradiated with fast (660 MeV)
protons. The method employed for separation has already been

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SOV/56-35-5-51/56

The Investigation of the Spectrum of Conversion Electrons of the Isotopes
of Lutetium With Neutron Deficit

described (Ref 5). Measurements were carried out by means of a prism- β -spectrometer and by means of a double-focusing spectrometer. The spectrum of the conversion electrons consists of many lines, which belong to Lu¹⁶⁹ (half-life ~1.5 days), Lu¹⁷⁰ (~2 days), Lu¹⁷¹ (~8 days), Lu¹⁷² (~6.7 days), Lu¹⁷³ (~200 days). Belonging of lines to the various corresponding isotopes was determined from the half-life. A table gives the energies of γ -transitions the conversion lines of which decrease with the period ~1.5 to 2 days. The second table contains the energies of the γ -transitions with the period 6.7 to 8 days. The energy of these transitions was determined from the energy of K- and L-conversion lines. There are 2 tables and 6 references, 4 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tehnicheskiy institut Akademii nauk
SSSR (Leningrad Physico-Technical Institute of the Academy
of Sciences, USSR)

Card 2/3

83708

S/056/60/038/004/001/048
B019/B070

24.6720

AUTHORS: Romanov, V. A., Iodko, M. G., Tuchkevich, V. V.TITLE: Long-lived Lutecium Isotopes /9PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 38, No. 4, pp. 1019-1026

TEXT: The authors have studied the conversion spectra of Lu¹⁷³- and Lu¹⁷⁴ isotopes. The measurements were made with a spectrometer with double focusing. Two different sources were used. Source I was separated from a Ta target 10-12 hours after it had been exposed to 660 Mev protons for a quarter of an hour; source II was separated from a Ta target which was exposed for about three months. Source II was used previously by B. S. Dzhelepov and others (Refs. 1,2). Most of the conversion lines found belong to Lu¹⁷³ whose relative intensities and energies (Table 1) are well known. The values obtained here agree with those of Yu. G. Bobrov and others (Ref. 1). The relative intensities of γ -rays measured by G. M. Gorodinskiy and others (Ref. 3) and collected in Table 2 are then

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Long-lived Lutecium Isotopes

83708

S/056/60/036/004/001/048
B019/B070

discussed. The level scheme of Yb^{173} (Fig. 2) is discussed with the help of the well known level scheme of Lu^{173} . A number of lines were found in the long-lived spectra of Lu isotopes which do not belong to Lu^{173} . The energy values of these lines are given in Table 3, and their identifications are discussed in detail. The authors are convinced that they could belong only to Lu^{174} . A possible variant of the decay scheme is discussed with the help of Fig. 3. The spins of the excited levels are discussed on the assumption that the ground state of $_{71}\text{Lu}^{174}_{103}$ has either the spin 6^- or 1^- . The half life of Lu^{174} is 165 ± 5 days. The lines found here are attributed to the M1 and M3 transitions ($E_\gamma = 44.7$ kev, and $E_\gamma = 59.0$ kev, respectively) of the isomeric states of Lu^{174} . The half life of the isomeric state is given to be 90 days. The authors thank Professor V. M. Kel'man for his interest in the work and valuable advice. L.A. Sliv and I. M. Band (Ref. 4) are mentioned. There are 3 figures, 4 tables, and 13 references: 6 Soviet, 6 US, and 1 Dutch.

Card 2/3

Long-lived Lutecium Isotopes

83708

S/056/60/C38/004/001/048
B019/B070

ASSOCIATION: Leningradskiy fiziko-tehnicheskiy institut Akademii nauk
SSSR (Leningrad Institute of Physics and Technology of the
Academy of Sciences, USSR)

SUBMITTED: August 7, 1959

X

Card 3/3

83709

S/056/60/032/004/C02/043
BG19/B070

24.6720

AUTHORS:

Iodko, M. G., Tuchkovich, V. V., Romanov, V. A., Kresin, O. M.

TITLE:

An Investigation of the Relative Intensities of Some
Conversion Lines in the Spectrum of Neutron-deficient
Lu-Isotopes M

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 38, No. 4, pp. 1027-1030

TEXT: The authors have investigated the strong lines of the conversion spectrum of the neutron deficient Lu-isotopes by means of a prism spectrometer. The two sources used here were obtained by separating the Lu-isotope fraction from a Ta-target which had been irradiated by 660-Mev protons. With the first source, the energies and the intensities of the conversion lines 66.70 and 75.85 kev in the Lu¹⁷¹ spectrum were measured, ✓
and 78.70 and 90.55 kev lines in the spectrum of Lu¹⁷². The relative intensities of the 84.19-kev L-lines in the Lu¹⁷⁰-spectrum, the 87.30-kev L-lines in the Lu¹⁶⁹-spectrum, and the 181.4 kev L-lines in the Lu¹⁷²-

Card 1/3

83709

An Investigation of the Relative Intensities of S/056/EO/032/004/002/043
Some Conversion Lines in the Spectrum of Neutron- B019/B070
deficient Lu-Isotopes

spectrum were measured with the second source. As the second source was very thick, the data obtained with it are to be considered only as rough values. The energies of the lines were measured by a method developed earlier by Romanov (Ref. 4). The energies of the conversion lines, and the calculated values of the transition energies are given in Table 1. The conversion lines are represented graphically in Fig. 1. The ratios of the L-conversion lines of the transitions with 66.74 and 75.89 kev in the Lu¹⁷¹-spectrum are given in Table 2. The analogous ratios for 78.74 kev-, 90.66 kev-, and 181.4 kev in the Lu¹⁷²-spectrum are given in Table 3. The theoretical and the experimental values are compared in the tables 2 and 3, and the multiplicities of γ -transitions are derived from the corresponding L-sub-shell intensities. L. A. Sliv and I. M. Band (Ref. 10) are mentioned. There are 1 figure, 3 tables, and 16 references: 6 Soviet, 8 US, and 2 Dutch.

Card 2/3

83709

An Investigation of the Relative Intensities of S/056/60/038/004/002/048
Some Conversion Lines in the Spectrum of Neutron- B019/BC7C
deficient Lu-Isotopes

ASSOCIATION: Leningradskiy fiziko-tehnicheskiy institut Akademii nauk
SSSR (Leningrad Institute of Physics and Technology of the
Academy of Sciences, USSR)

SUBMITTED: August 7, 1959

X

Card 3/3

TUCHKEVICH, V.V.

AUTHORS: Kel'man, V.M., Metskhvarishvili, R.Ya., Romanov, V.A. 56-3-6/59
Tuchkevich, V.V.,

TITLE: The Investigation of Conversion Lines in the β -Spectrum of Ir¹⁹².
(Issledovaniye konversionnykh liniy v β -spektre Ir¹⁹²)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 3, pp.588-594
(USSR)

ABSTRACT: With the help of a prism- β -spectrometer (resolving of 0,04 %) the conversion coefficients and the multipole order of the following β -lines were determined:

E β in KeV	K/L	K/M	multipole order
136,3			(80±1)% E2 + (20±1)% M1
201,3	1,85±0,04		(86±2)% E2 + (14±2)% M1
205,8	1,83±0,04		E2
295,8	2,35±0,04	8,9±0,2	E2
308,5	2,38±0,02	9,5±0,2	(97±2)% E2 + (3±2)% M1
316,5	2,22±0,02	9,3±0,2	E2
468,0	3,0 ±0,1	10,2±0,2	E2
604,5	4,7 ±0,1		(88±2)% E2 + (12±2)% M1

Card 1/2

The Investigation of Conversion Lines in the β - Spectrum of Ir¹⁹² 56-3-6/59

There are 2 tables, 3 figures, and 5 Slavic references.

ASSOCIATION: Leningrad Physical-Technical Institute AN USSR
(Leningradskiy fiziko-tehnicheskiy institut Akademii nauk SSSR)

SUBMITTED: March 18, 1957

AVAILABLE: Library of Congress

Card 2/2

ZHILINA, Ye.A.; MODZGORISHVILI, T.I.; TUCHKIN, G.M.; DIKKER, G.L., spetsred.;
MURASHOVA, O.I., red.; SOKOLOVA, I.A., techn. red.

[From the experience of the "IAva" tobacco factory] Iz opyta
tabachnoi fabriki "IAva." Moskva, Pishchepromizdat, 1957. 41 p.
(Moscow--Tobacco industry) (MIRA 11:9)

TUCHKIN G. M.

Tuchkin G. M., "Automatic Regulation of Air Conditioning Processes,"
Tabak [Tabacco], 1953, No 1, Pages 23-27.

TUCHKIN G. M.

Tuchkin G. M., Upolotnyayushchiye kryshki reguliruyushchikh klapanov kotlov
vysokogo davleniya [Packing Covers for Regulating Valves in High-Pressure
Boilers], Elektricheskiye stantsii, 1953, No 5, Page 48, 2 figures.

TUCHKIN, G. M.

Factories - Air Conditioning

Automatic regulation of air-conditioning processes. Tabak 14 No. 1, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953. Unclassified.

KALIEYEV, A. M.; IASHKOV, V. S.: TECHNICHESKAYA KARTINA

Air Conditioning

Planning apparatuses for air-conditioning. Tabek, 13, no. 4, 1952.

Monthly List of Russian Accessions, Library of Congress, October 1952. UNCLASSIFIED.

TUCHKIN, C. M.

Air Conditioning

Air-conditioning apparatus. Tabak, 13, No. 4, 1952.

Montly List of Russian Accessions, Library of Congress October 1952 UNCLASSIFIED

TUCHKOV, B.; ZDANOVICH, A.

Technical machine service centers abroad. Vnesh.torg. 43
(MIRA 16:2)
no.2:32-33 '63.
(Machinery industry)

TUCHKOV, B.

Indian farmers on a Soviet tractor. Vnesh. torg. 43 no.8:34-35
'63. (MIRA 16:8)
(India--Tractors)

TUCHKOV, B. E.

HYDRODYNAMICS

"Principles in the method of calculation of single-stage hydro-transformers." V. I. Lapidus.
Reviewed by B. E. Tuchkov. Avt. trakt. prom. No. 8, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1952 1953, Uncl.

TUCHKOV, B. Ye.

Lapidus, V. I.

"Principles in the method of calculation of single-stage hydro-transformers." V. I. Lapidus.
Reviewed by B. Ye. Tuchkov, Avt. trakt. prom., No. 8, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1952 1953, Uncl.

SOV-11-58-10-7/12

AUTHOR:

Tuchkov, I.I.

TITLE:

Carnian Deposits in the North-East Part of the USSR and
Their Lower Limit (Otlozheniya Karniyskogo yarusa severo-
vostoka SSSR i ikh nizhnyaya granitsa)

PERIODICAL:

Izvestiya Akademii nauk SSSR, Seriya geologicheskaya,
Nr 10, 1958, pp 87 - 101 (USSR)

ABSTRACT:

The author describes the Carnian deposits in main cross-sections of different regions of the north-east part of the USSR. He divides these deposits into two levels, upper and lower, according to the fossilized fauna peculiar to each level, and compares this fauna with fossils found in Carnian deposits of North America, the Alps and Indonesia. He proposes, as a result of this comparison, to include the lowest part of the Carnian level containing different species of the Nathorstites, into the Ladinian stage. The following scientists who worked in those regions are mentioned: P. Wittenburg, E. Toll, A. Bunge, P. A. Kazanskiy, M.V. Bayarunas, L.D. Kiparisova, S.V.

Card 1/2

Carnian Deposits in the North-East Part of the USSR and Their Lower Limit. SOV-11-58-10-7/12

Obruchev, A.A., Nikolayev, Yu.N., Popov. There is 1 map,
1 table and 17 references, 5 of which are Soviet, 6 German,
4 English and 2 American.

SUBMITTED: December 10, 1956

ASSOCIATION: Ministerstvo Geologii i okhrany nedor SSSR, 4-ye geologicheskoje upravleniye, Moskva (Ministry of Geology and Conservation of Mineral Resources, 4th Geological Administration, Moscow)

1. Geology--USSR 2. Paleoecology--Analysis 3. Geological
time--Determination

Card 2/2

TUCHKOV, I.I.

Recent data on the stratigraphy of upper Triassic and Jurassic
deposits in the western shore area of the Sea of Okhotsk (Toro-
Tugur region). Dokl. AN SSSR 134 no.3:658-661 S '60. (MIRA 13:9)

1. Predstavлено акад. Н.С. Шатским.
(Tugur Bay region—Geology, Stratigraphic)

TUCHIKOV, I.I.

New diagram of the Mesozoic stratigraphy of the lower
Amur Valley. Izv.vys.ucheb.zav.; geol.i razv. no.3:
3-22 My '60. (MIRA 13:7)

1. Ministerstvo geologii i okhrany nedor SSSR.
(Amur Valley--Geology, Stratigraphic)

TUCHOLKA-SZMEJA, BARBARA

POLAND/Analytical Chemistry. Analysis of Inorganic Substances. E-2

Abs Jour: Ref. Zhur-Khimiya, 1958, No II, 35890.

Author : Barbara Tucholka-Szmeja.

Inst : Not given.

Title : Spectrographic Determination of Strontium in Minerals.

Orig Pub: Chem. Analit., 1956, I, No 4, 255-262.

Abstract: Spectra are stimulated in acetylene-air flame with the application of the Zeiss burner and atomizer (model III) and registered on the spectrograph Q-24. It is established, that the intensity of the line Sr 4067. 3 A diminishes in presence of Mg and Ca. Therefore, Ca and Mg are preliminary separated from Sr. The content of Sr is approximately established before the analysis by way of stimulation of the spectrum in the alternating current arc at the evaporation from the socket of

Card : 1/2

TUCHKOV, I.I.

*Tentative correlation of Aldan coal seams based on the results of
spectroscopic analysis [with summary in English]. Sov. geol. 1
no. 3:120-123 Mr '58.* (MIRA 11:5)

1. 4-ye geologicheskoye upravleniye.
(Aldan Basin—Coal—Geology)

FLORENSOV, N.A.; TRESKOV, A.A.; SOLONENKO, V.P.; TICHKOV, I.I.
Discussions. Cecil. i geofiz. no.3:162-164 '62. (MIRA 18:2)